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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/735,608 | 12/12/2003 | Marcel P. Bruchez | QDC0014.20 | 1956 |

23358 7590 01/30/2007
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| EXAMINER | |
|---|---|
| DO, PENSEE T | |
| ART UNIT | PAPER NUMBER |
| 1641 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|---|---|---|
| 3 MONTHS | 01/30/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/735,608 | BRUCHEZ ET AL. | |
| | Examiner | Art Unit | |
| | Pensee T. Do | 1641 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *11 October 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1 and 3-41* is/are pending in the application.

4a) Of the above claim(s) *17-37* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-16 and 38-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1, 3-41* are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Amendment Entry & Claims Status*

The amendment filed on October 11, 2006 has been acknowledged and entered.

Claims 1, 3-41 are pending.

Claims 1, 3-16, 38-41 are being examined.

Claims 17-37 are withdrawn from further consideration.

### *Withdrawn Rejection(s)*

Rejections under 103 in the previous office action are withdrawn herein.

### *New Grounds of Rejection*

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3-4 are rejected under 35 U.S.C. 102(e) as being anticipated by Jacobson et al. (US 6,953,656).

Jacobson teaches conjugate comprising of a nanocrystal and a polycationic peptide. The nanocrystals are semiconductors such as Cadmium selenide (CdSe) (see col. 8, lines 18-20; col. 5, lines 14-20).

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson in view of Bawendi.

Jacobson has been discussed above.

However, Jacobson fails to teach the nanocrystal has a core surrounded by a shell comprising of ZnS.

Bawendi teaches a composition comprising fluorescent semiconductor nanocrystals associated to a molecule such as cells, prokaryotic or eukaryotic. The semiconductor nanocrystals comprise a CdSe core and a ZnS shell. The composition is also associated with cell membranes. The nanocrystals are used to label cellular organelles, and visualize location in a cell (see col. 3, line 60-col. 4, line 62; col. 19, lines 58-60; col. 20, lines 51-59; col. 29, lines 41-42).

It would have been obvious to one of ordinary skills in the art to use the nanocrystals with core and shell composition as taught by Bawendi in place of the nanocrystals of Jacobson because such shell provides functional groups for conjugation with the proteins or peptides.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3-7, 11-13, 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art in the present specification in view of Bawendi (US 6,306,610).

The present specification describes that: "Tat peptide has been used to introduce magnetic nanoparticles into mammalian cells". (see spec. pg. 53, line 10).

However, it fails to describe that the Tat peptide has been used to introduce nanocrystals into cells and kit comprising the nanocrystal complex and instruction for using such complex.

Bawendi teaches a composition comprising fluorescent semiconductor nanocrystals associated to a molecule such as cells, prokaryotic or eukaryotic. The semiconductor nanocrystals comprise a CdSe core and a ZnS shell. The composition is also associated with cell membranes. The nanocrystals are used to label cellular organelles, and visualize location in a cell (see col. 3, line 60-col. 4, line 62; col. 19, lines 58-60; col. 20, lines 51-59; col. 29, lines 41-42).

It would have been obvious to one of ordinary skills in the art to replace the magnetic nanoparticles as admitted as prior art in the present specification with a nanocrystals for use with TAT peptide to label cells because nanocrystals exhibit high fluorescent intensity (for detection in small quantities), a separation of at least 50 nm between the absorption and fluorescing frequencies, solubility in water, ability to be readily linked to other molecules, stability towards harsh conditions and high

temperatures, symmetric, nearly Gaussian emission lineshape for easy deconvolution of multiple colors and compatibility with automated analysis. Furthermore, one of ordinary skills in the art would have reasonable expectation of success in replacing the magnetic nanoparticles with the nanocrystals of Bawendi because Bawendi teaches that the nanocrystals can be used to label cellular organelles and visualize a location in a cell. Regarding claims 38 and 39, it would have been obvious to one of ordinary skills in the art to package the combined composition into a kit with instructions for economical convenience.

Claims 8-10, 14-16, 40 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art in the present specification in view of Bawendi as applied to claims 1 and 12 above, and further in view of Frankel (US 5,652,152).

The present specification and Bawendi have been discussed above.

However, they fail to teach that the cationic polymer is a tat peptide from the protein transduction domain of the HIV tat protein; comprises the sequence RKKRRQRRR (SEQ ID NO: 1); has from 5 to 25 contiguous Lys and/or Arg residues. They also fail to teach kit comprising a semiconductor nanocrystal complex and instruction for using such complex.

Frankel teaches intracellular delivery of cargo molecules by the use of transport polypeptides which comprise HIV tat protein or one or more portions thereof and which are covalently attached to the cargo molecules. The transport polypeptides are characterized by the presence of the tat basic region (amino acids 49-57). The biological active cargo molecules such as polypeptides, nucleic acids are

delivered/transported into the cytoplasm and nuclei of cells in vitro and in vivo. (see abstract). Label such as a fluorescent was used to study the transported molecules across the cell membrane. The label is attached to the tat peptide. (see col. 42, lines 24-29). Frankel teaches sequence ID No. 4, amino acids 12-20, comprising Arg Lys Lys Arg Arg Gln Arg Arg Arg. (see col. 55-56, sequence ID. NO. 4).

It would have been obvious to use HIV tat peptide as taught by Frankel in place of the Tat peptide admitted as prior art in the present specification and replace the fluorescent label as taught in Frankel with the nanocrystals of Bawendi because such HIV tat peptide can deliver polypeptides, nucleic acids into cells and the nanocrystal of Bawendi exhibit high fluorescent intensity (for detection in small quantities), a separation of at least 50 nm between the absorption and fluorescing frequencies, solubility in water, ability to be readily linked to other molecules, stability towards harsh conditions and high temperatures, symmetric, nearly Gaussian emission lineshape for easy deconvolution of multiple colors and compatibility with automated analysis. One of ordinary skills in the art would have reasonable expectation of success in combining theses references because tat peptide can bind to metal particles, and nanocrystals are nanoparticles; tat peptide can also enter cells along with nanocrystals and HIV tat peptide is a tat peptide which can enter cells. Regarding claims 40 and 41, it would have been obvious to one of ordinary skills in the art to package the combined composition into a kit with instruction of using it for economic convenience since Frankel teaches that the tat polypeptide can be used as research laboratory reagents, either alone or as part of a transport polypeptide conjugation kit (see col. 7, lines 30-32).

***Response to Arguments***

Applicant's arguments with respect to claims 1, 3-16, 38-41 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pensee T. Do whose telephone number is 571-272-0819. The examiner can normally be reached on Monday-Friday, 7:00-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Pensee T. Do
Patent Examiner
January 19, 2007

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